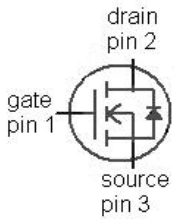
OptiMOS™ 5 Power-Transistor

Features

- N-channel, normal level
- Optimized for FOM_{OSS}
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC[1] for target application
- Ideal for high-frequency switching and synchronous rectification

Product Summary

V_{DS}	100	V
$R_{DS(on),max}$	2.0	mΩ
I_D	176	A



RoHS

Halogen-Free

Type	IPB020N10N5
	
Package	PG-TO263-3
Marking	020N10N5

Maximum ratings, at T_A=25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	T_C=25 °C	176	A
		T_C=100 °C	135	
Pulsed drain current[2]	$I_{D,pulse}$	T_C=25 °C	704	
Avalanche energy, single pulse	E_{AS}	I_D=50 A, R_{GS}=25 Ω	1166	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_C=25 °C	375	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 175	°C
IEC climatic category; DIN IEC 68-1			55/175/56	

[1] J-STD20 and JESD22

[2] see Diagram 3

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - case	R_{thJC}		-	0.3	0.4	K/W
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint	-	-	62	
		6 cm^2 cooling area[4)]	-	-	40	
Soldering temperature, wave and reflow soldering are allowed	T_{sold}	reflow MSL1			260	°C
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=1 mA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=270 µA	2.2	3	3.8	
Zero gate voltage drain current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V, T_j=25 °C	-	0.1	7	µA
		V_{DS}=100 V, V_{GS}=0 V, T_j=125 °C	-	10	100	
Gate-source leakage current	I_{GSS}	V_{GS}=20 V, V_{DS}=0 V	-	1	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=100 A	-	1.7	2.0	mΩ
		V_{GS}=6 V, I_D=50 A	-	2.0	2.5	
Gate resistance[5)]	R_G		-	1.3	2	Ω
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=100 A	124	248	-	S

[4)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.

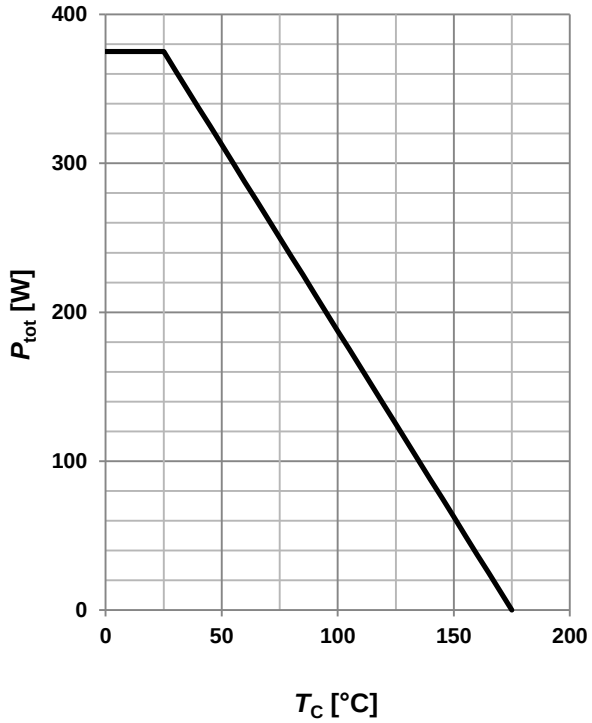
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[5]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz	-	12000	15600	pF
Output capacitance	C_{oss}		-	1810	2353	
Reverse transfer capacitance	C_{rss}		-	80	140	
Turn-on delay time	$t_{d(on)}$	V_{DD}=50 V, V_{GS}=10 V, I_D=100 A, $R_{G,ext}$=1.6 Ω	-	33	-	ns
Rise time	t_r		-	26	-	
Turn-off delay time	$t_{d(off)}$		-	77	-	
Fall time	t_f		-	29	-	
Gate Charge Characteristics[6]						
Gate to source charge	Q_{gs}	V_{DD}=50 V, I_D=100 A, V_{GS}=0 to 10 V	-	54	-	nC
Gate to drain charge[5]	Q_{gd}		-	34	51	
Switching charge	Q_{sw}		-	52	-	
Gate charge total[5]	Q_g		-	168	210	
Gate plateau voltage	$V_{plateau}$		-	4.5	-	V
Output charge[5]	Q_{oss}	V_{DD}=50 V, V_{GS}=0 V	-	213	283	nC
Reverse Diode						
Diode continous forward current	I_S	T_C=25 °C	-	-	176	A
Diode pulse current	$I_{S,pulse}$		-	-	480	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=100 A, T_j=25 °C	-	0.9	1.2	V
Reverse recovery time[5]	t_{rr}	V_R=50 V, I_F=I_S, di_F/dt=100 A/µs	-	99	198	ns
Reverse recovery charge[5]	Q_{rr}		-	287	574	nC

[5] Defined by design. Not subject to production test

[6] See figure 16 for gate charge parameter definition

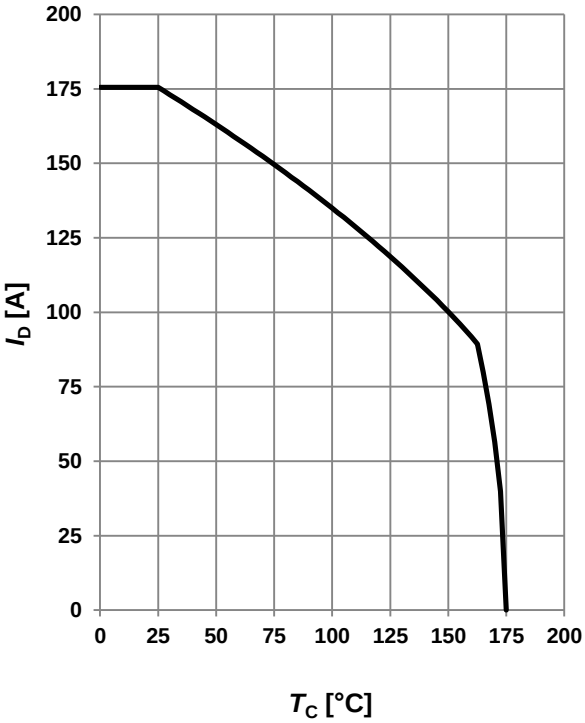
1 Power dissipation

$P_{tot}=f(T_C)$



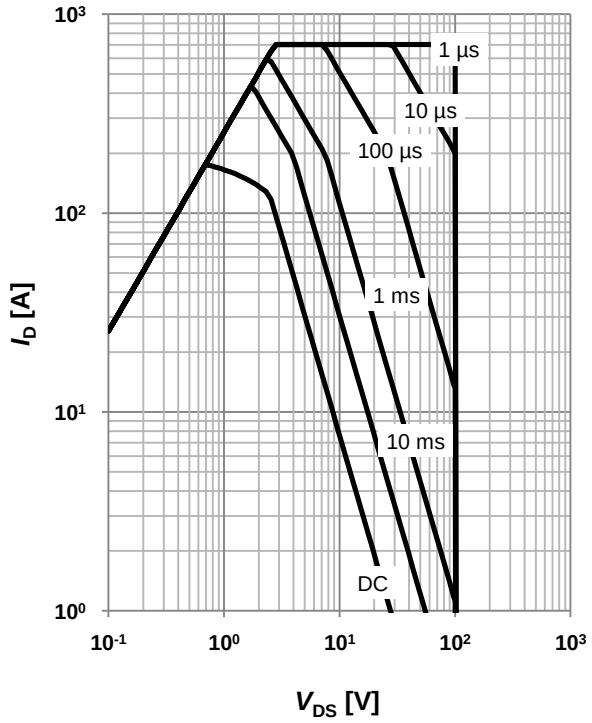
2 Drain current

$I_D=f(T_C)$; $V_{GS}\geq 10$ V



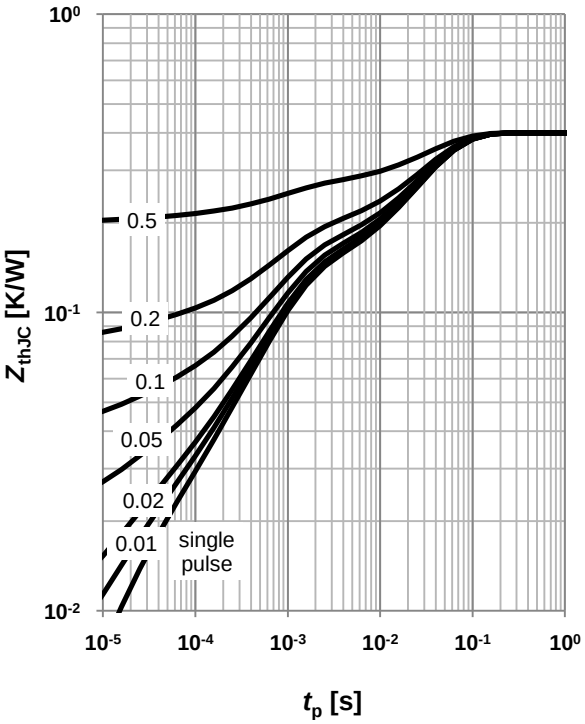
3 Safe operating area

$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$
parameter: t_p



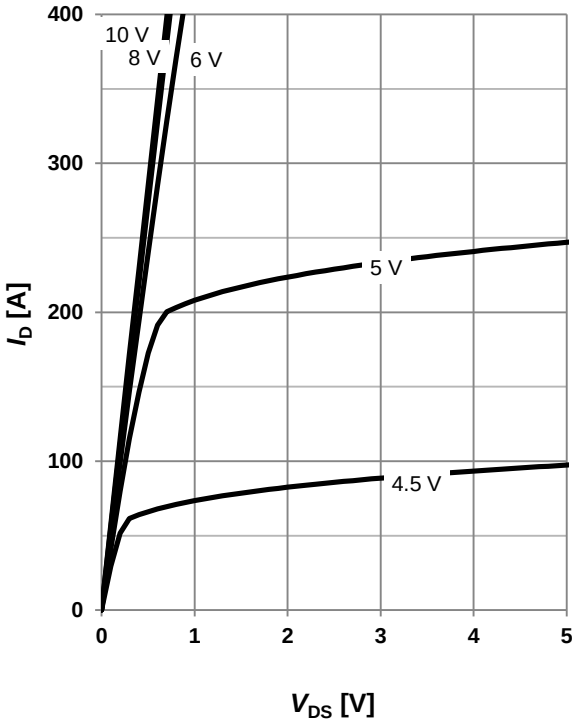
4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$
parameter: $D=t_p/T$



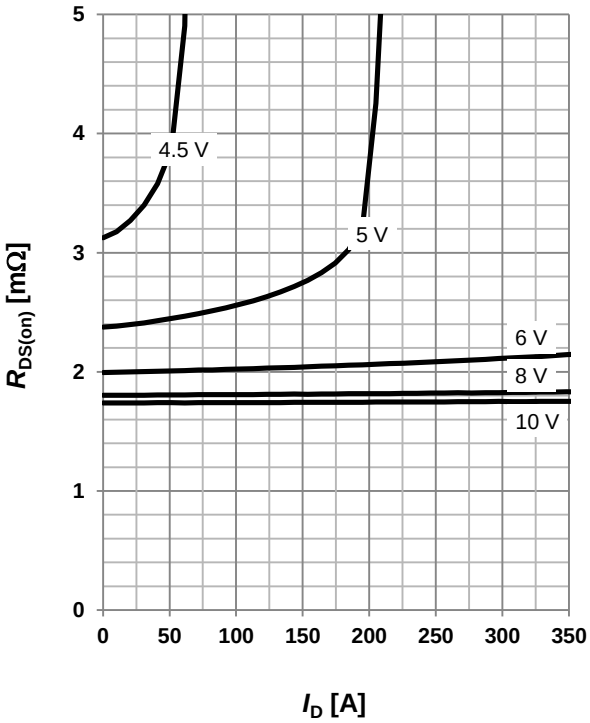
5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C
parameter: V_{GS}



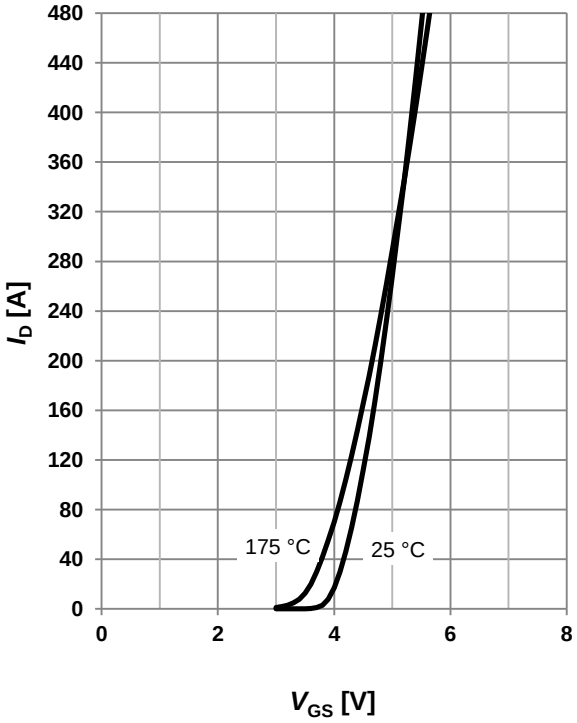
6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C
parameter: V_{GS}



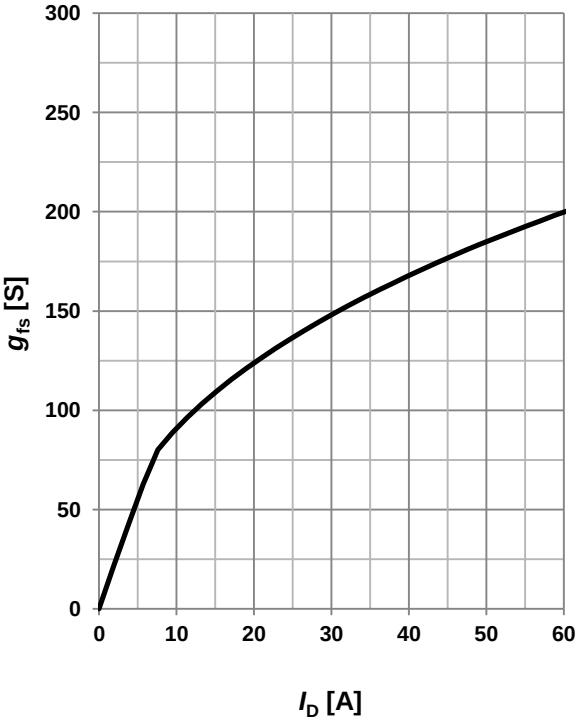
7 Typ. transfer characteristics

I_D=f(V_{GS}); |V_{DS}|>2|I_D|$R_{DS(on)max}$
parameter: T_j



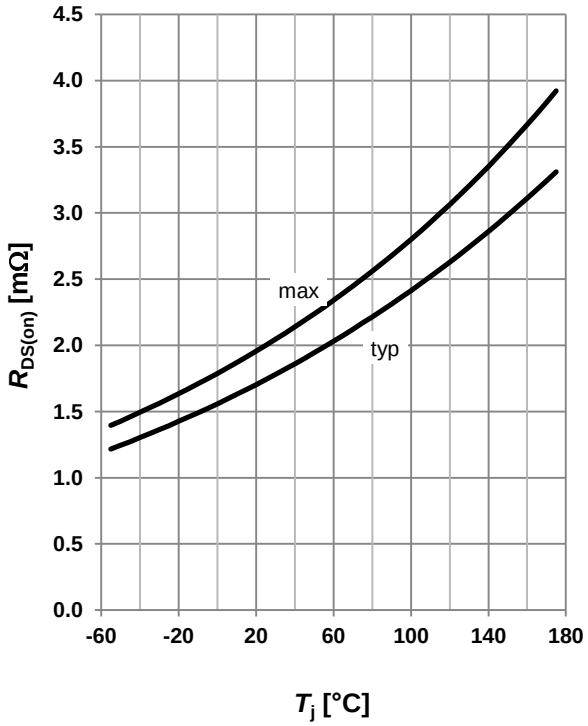
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



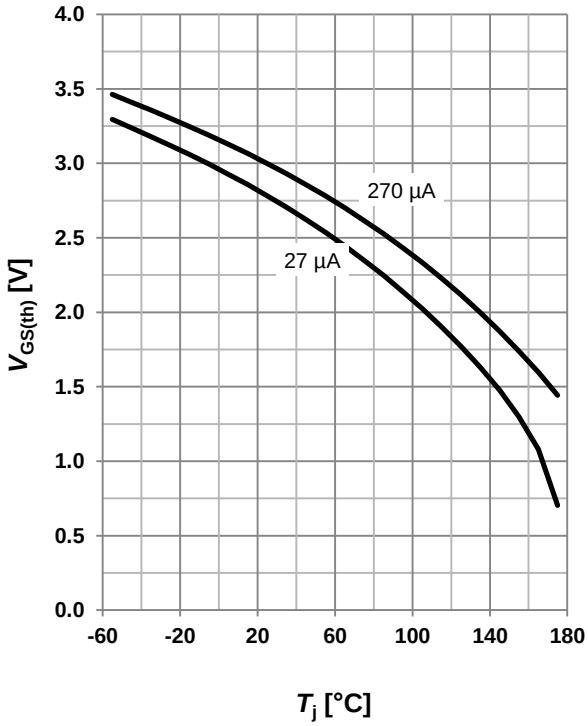
9 Drain-source on-state resistance

$R_{DS(on)}$=f(T_j); I_D=100 A; V_{GS}=10 V



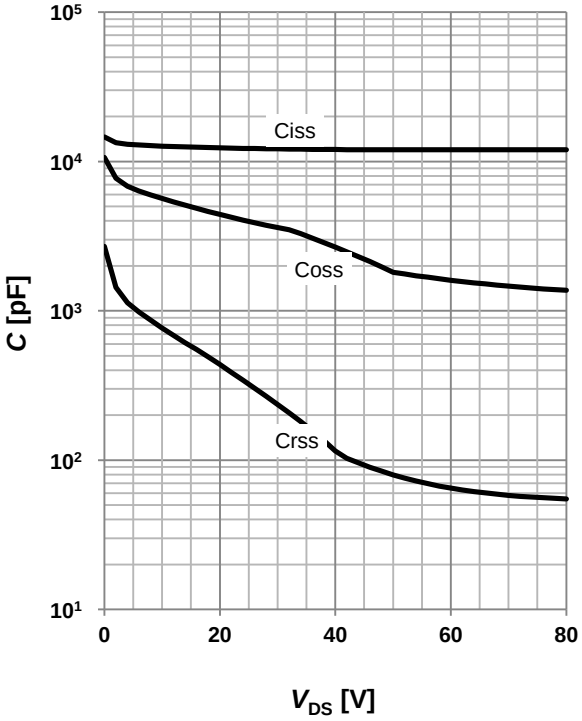
10 Typ. gate threshold voltage

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}
parameter: I_D



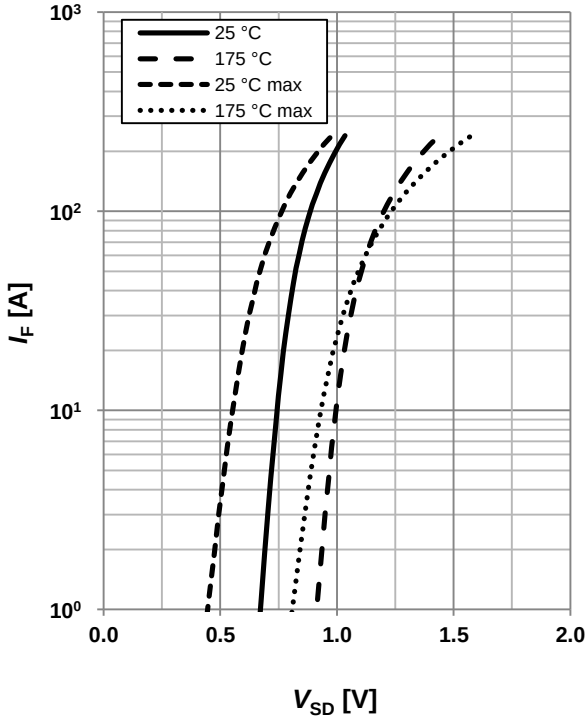
11 Typ. capacitances

C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



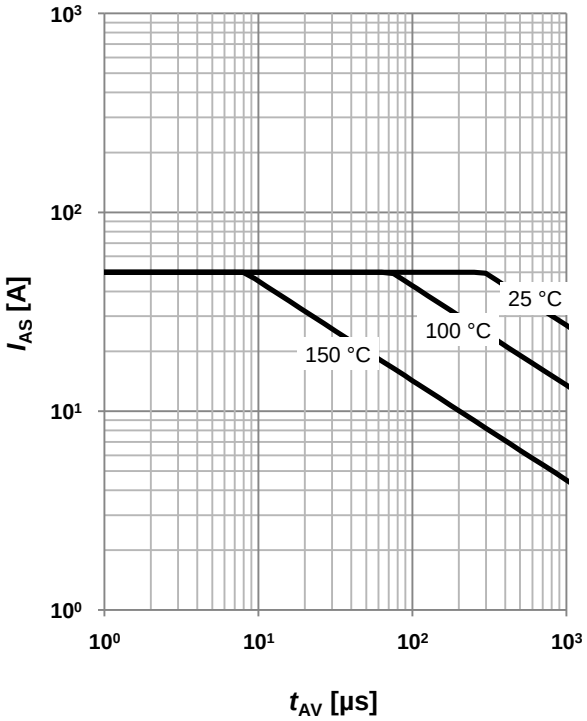
12 Forward characteristics of reverse diode

I_F=f(V_{SD})
parameter: T_j



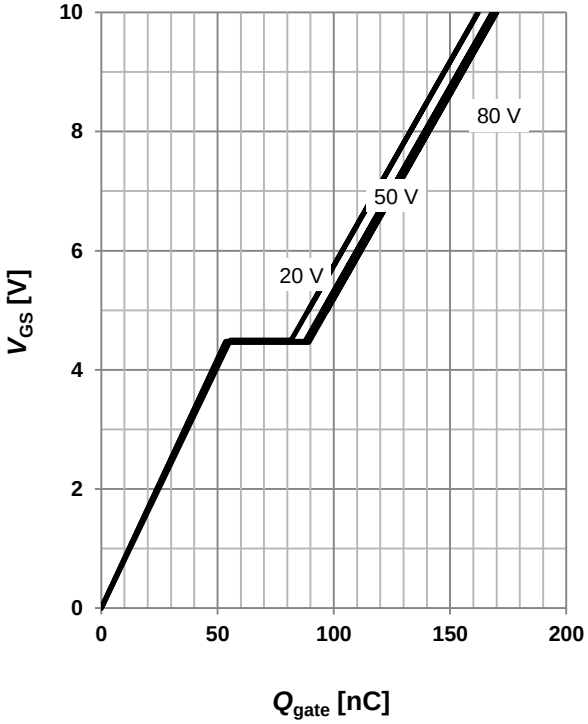
13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω
parameter: $T_{j(start)}$



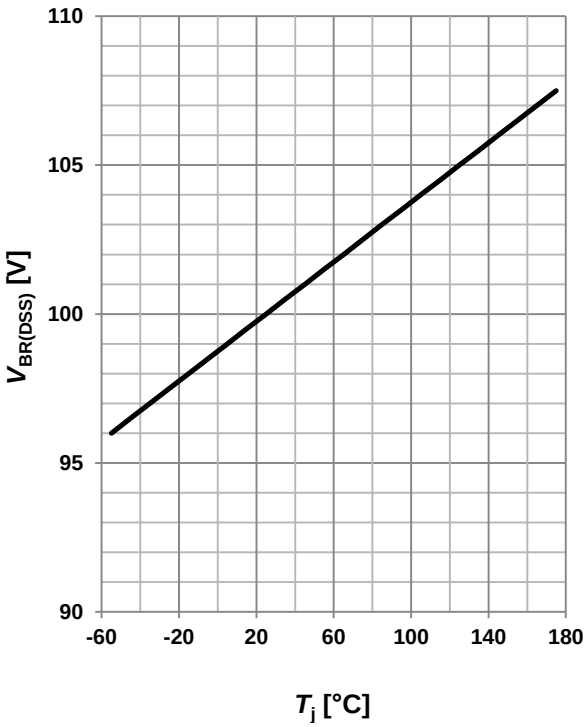
14 Typ. gate charge

V_{GS}=f(Q_{gate}); I_D=100 A pulsed
parameter: V_{DD}

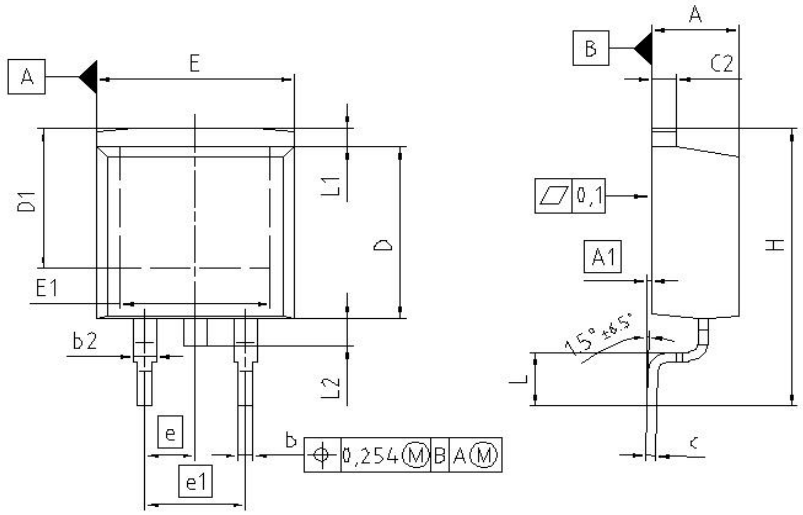


15 Drain-source breakdown voltage

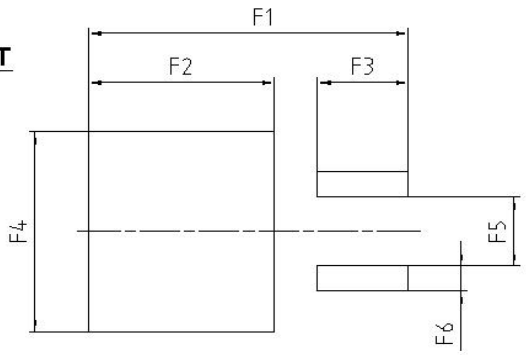
$V_{BR(DSS)}$=f(T_j); I_D=1 mA



PG-TO-263 (D²-Pak)



FOOTPRINT



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.300	4.572	0.169	0.180
A1	0.000	0.254	0.000	0.010
b	0.650	0.850	0.026	0.033
b2	0.950	1.321	0.037	0.052
c	0.330	0.650	0.013	0.026
c2	0.170	1.400	0.046	0.055
D	8.509	9.450	0.335	0.372
D1	7.100	-	0.280	-
E	9.800	10.312	0.386	0.406
E1	6.500		0.256	
e	2.540		0.100	
e1	5.080		0.200	
N	2		2	
H	14.605	15.875	0.575	0.625
L	2.200	3.000	0.087	0.118
L1	-	1.600	-	0.063
L2	1.000	1.778	0.039	0.070
F1	16.050	16.250	0.632	0.640
F2	9.300	9.500	0.366	0.374
F3	4.500	4.700	0.177	0.185
F4	10.700	10.900	0.421	0.429
F5	3.630	3.830	0.143	0.151
F6	1.100	1.300	0.043	0.051

REFERENCE	JEDEC TO263
SCALE	0 5 5 7.5mm
EUROPEAN PROJECTION	
ISSUE DATE	12-02-2006
FILE	TO263_2

Published by
Infineon Technologies AG
81726 Munich, Germany
© 2014 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

Information
For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (www.infineon.com).

Warnings
Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.